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Site Construction Guidebook

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City and Town Commons Program

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MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL MANAGEMENT'S

SITE CONSTRUCTION GUIDEBOOK

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INTRODUCTION

The Massachusetts Department of Environmental Management (DEM) sponsors site construction projects which improve landscapes for the public benefit. This construction includes the creation or repair of parks and trail systems, nature preserves, and urban open spaces.

DEM offers this publication to aid communities administering state-sponsored site construction and direct them toward a successful outcome. It offers a chronological overview of the key phases of public site construction. It also outlines the roles and responsibilities of each participant in the process and recommends procedures for communication between them. This manual provides information from the Massachusetts General Laws and DEM standard construction contract along with descriptions of current industry practices. It prepares communities to act as competent administrators and discerning consumers of construction services.

PARTICIPANTS AND PROCESS

Communities undertaking public construction projects will find themselves overseeing a complex process involving many participants. In addition to community representatives, others involved include DEM staff, design professionals, contractor and subcontractors, and their various representatives. Though they approach from different vantage points, these individuals work together to resolve any problems which occur in carrying out the construction process.

Key Participants

The Community. The community is contractually tied to DEM, the design professional, and the construction contractor. Administering these complex agreements requires a well-organized system of communication and decision-making which rests heavily on a competent project team. The community makes a wise investment by appointing a skillful team. An expert construction supervisor working at the site greatly facilitates procedures there. The project coordinator works in partnership with the construction supervisor, but in an office rather than at the site. Together, they keep all aspects of the project running smoothly.

The project coordinator's job is complex. He/she oversees the work of the construction supervisor and the designer, reports to DEM, coordinates with local agencies, administers the construction contract, manages the office, and handles inquiries from the press and public. The project coordinator is familiar with all aspects of the project and is best able to delegate responsibilities and coordinate efforts among the participants. All communications pass through his/her office. This person assumes some administrative responsibilities traditionally assigned to the designer, such as organizing and conducting certain meetings. In so doing, the project coordinator reduces demands on the designer's time, spending community money more efficiently. In dividing responsibilities between the project coordinator and the designer, the community should consider its staff workload and technical capabilities against those of the design firm.

The construction supervisor (sometimes known as an inspector) works primarily at the site. He/she should be familiar with all construction trades involved in the project as well as Massachusetts and local construction codes and regulations. In monitoring construction, he/she represents the owner's interests at the site. He/she keeps daily construction records and apprises the designer and project coordinator of progress or problems on the site.

The Designer. The designer's major product is creation of the contract documents for the project. However, his/her continued participation is critical to the project's success. The designer provides valuable information and advice to the community during construction. He/she visits the site regularly during construction, ensuring adherence to the design intent. Acting on the community's behalf, the designer can assess the contractor's use of labor, equipment, and construction techniques. The designer judges the reasonableness of the contractor's requests for payment, certifies which work is satisfactorily complete, and identifies deficiencies in materials and workmanship during construction.

The Contractor. The contracting company or firm selected for construction of a public project should be well experienced in comparable projects with a good reputation for quality and performance. The owner or manager approaches the job as a business investment of time, labor, equipment, and capital. When unexpected conditions arise on the site, the contractor is likely to be the first to identify them. If, for example, the crew unexpectedly encounters rock ledge, the contractor will need to assign extra labor and equipment from other jobs to extract it or work will fall behind schedule. In such situations, prompt involvement of the designer and project coordinator to resolve the situation with the contractor will save money and prevent frustration for all concerned.

Communication

Construction depends on communication. First the community conveys its needs to the designer, who uses his/her understanding of those needs to create a plan and construction drawings. The contractor, in turn, constructs the project according to the information contained in the contract drawings and specifications. The contract drawings and specifications together constitute legally binding construction documents. They describe in detail the work to be done. Despite the explicitness of contract documents, many points within them will need to be clarified, confirmed, or negotiated during construction. Response to unexpected site conditions, unavailable materials, or delays demands constant communication between participants.

Prompt, thorough communication leads to quick resolutions of most common problems and helps avoid others. Participants should share useful as well as critical information as it becomes available.

They should be accessible and reliable. In addition, everyone should clarify or confirm oral agreements in writing, through follow-up letters, change orders, or field orders. Should anything serious go wrong, this documentation will be crucial.

Poor communication leaves room for misunderstandings, which may lead to poor or incorrectly-done work, disputes, financial loss, and even lengthy litigation.

As this phase begins, the project coordinator works closely with the designer in completing review of final designs. A prescribed sequence of activities then moves the project through the stages of bidding, bid review, and contract award. Finally, a preconstruction conference and issuance of a Notice to Proceed mark the project's transition from the preconstruction to construction phase.

Selecting a Procurement Method

Before the designer prepares the contract documents for review, the project coordinator will determine which procurement method best suits the project. Three methods of procurement are typical. These are the formal sealed bid, competitive negotiation processes, and small purchase. All three have in common the provision for maximum open and free competition, but differ in when and how each is best used.

A COMPARISON OF PROCUREMENT PROCESS

	Formal Sealed Bid Method	Small Purchase Method	Competative Negotiation
Dollar Amount	o over $2000	o under $2000	o over $2000
How Advertised	o Central Register o Newspapers, o Trade journals	o Quotes solicited from at least 3 known sources	o Central Register o Newspapers o Quotes solicited from at least 3 known sources
Major Criterion for Contract Award	o Low bid	o Low bid	o Factor other than price (quality, time, etc.)
Type of Contractor	o General o Broad scope of services	o General or specialized o Limited scope of services	o Specialized o Limited scope of services
Type of Specification	o Detailed o Product oriented	o Brief o Product oriented	o Conceptual o Process oriented

Formal Sealed Bid Method. Most communities will find that using this process to let a single contract for all goods and services required to build the project is the most appropriate. Formal sealed bid is the most commonly used method of procurement for site improvement projects because it is the simplest to execute. Through it, a single procurement process is used to hire a general contractor who will be responsible for carrying out the entire construction project. The general contractor saves the community time and money by hiring, scheduling, supervising, inspecting, and paying the numerous subcontractors and suppliers involved in the project. The general contractor also assumes responsibility for the construction site for the duration of the contract term, protecting the community from liability for damages incurred during construction.

Because it is the preferred method, this guidebook is organized around the detailed sequence of activities involved in carrying out a formal sealed bid contract. Small purchase and competative negotiation will be less commonly used and therefore are presented in less detail.

Competitive Negotiation Method. This method is rarely used in contract procurement for publicly funded site work. It is more commonly used for hiring consultants such as designers. However, it may be appropriate for hiring highly specialized construction services. Replicating historic site furnishings (lightpoles, fencing, benches) and creating or restoring art objects are examples of goods and services to which this procurement method might be applied.

Small Purchase Method. The community may divide a project, using the small purchase method to buy materials or hire equipment and services for use by volunteers or municipal work crews while procuring construction services for the rest of the project through the formal sealed bid process. The use of these two methods is preferable when a community plans to split the construction work between a private and municipal or volunteer crew. Alternatively, a contractor may be hired through the formal sealed bid process to supply all materials and/or equipment. This second arrangement is usually the more costly method of procurement because the contractor will charge a handling fee for the items supplied.

Evaluating the Success of the Procurement Process

A procurement process succeeds when it stimulates competition and produces responsive bids. The appropriateness of the procurement method to the project is important, but is not the only factor which contributes to the success of the process. How well the contract

documents quantify and qualify the work to be done and the type and extent of solicitation used strongly affect the procurement process outcome. The way in which specialized services and general contracting procedures are combined or separated is also important in attracting competitive bids. The community must consider these factors when planning for the procurement process.

When there are too few bidders or bid prices are inflated, the community may need to reject the bids, revise the contract documents and rebid the job with increased solicitation efforts. If a few of the included work items discouraged general bidders from participating, those items may be considered for removal and separate procurement from the general contract.

Alternatively, they may be provided for in the general contract by use of an allowance item[1] (a set dollar amount which all bidders must carry in their contract price to cover certain items). An allowance item may be useful when the contract includes a good or service which a general contractor does not regularly perform such as patternmaking for iron fencing. Another example is a situation in which the community is aware of a potential problem that cannot be adequately investigated prior to beginning construction such as the condition of a fountain's internal mechanisms or the suitability of subsurface material. In these situations use of an allowance can protect the community from costly change orders. After contract award, the community negotiates with the contractor to determine how payment will be made for costs incurred under the allowance. The community may require that the contractor use the same procedure for justifying pay requests as is specified for change order work done under protest. (See "Changes in the Work" section.)

Assembling and Review of Contract Documents

Documents are organized and packaged according to the selected procurement method. A simple work or service order (sample form provided in Appendices) is used with procurement by the small purchase method while formal sealed bid and competitive negotiation methods require a detailed bid package consisting of drawings, specifications, and addenda issued, if any. The specifications are made up of the general and special conditions, bid forms, technical specifications that refer to the drawings, and wage rates. The community's affirmative action, equal employment opportunity, women, minority, small and local business utilization plans, if any, are included in the specifications. Prevailing wage rates are set on a project-by project basis. If both state and federal funds are being used to implement the project, both sets of wage rates must be included in the specifications. To obtain up-to-date state rates, send inquiries to the Massachusetts Department of Labor and Industries, 100 Cambridge St., Boston, MA. 02202. The letter of inquiry should include the

project name and location, type of work, and the awarding authority. Wage rates provided by this office are valid for ninety days. If the contract is not awarded within that time, an up-dated set of rates must be obtained.

A practical concern in assembling the specifications is that the documents must be bound securely so that portions are not lost in use and cannot be easily altered. However, it will be necessary to later insert addenda, copies of executed bid forms, and executed originals of the contract forms so that each party to the contract receives an executed original for their records after the contract is awarded. To accomodate both functions, a binding system should be chosen that allows opening and rebinding by machine, but not by hand.

When the contract documents are essentially (98%) complete, the designer prepares a final cost estimate and releases draft copies of the plans and specifications for final review. The project coordinator sends copies to all agencies who participated in the design process. Plans and specifications and final cost estimates must be reviewed by DEM. Other agencies useful as reviewers include the local and state department of public works, the municipal engineer, public utility companies, and local and state historical commission. It is advisable to have the construction supervisor on staff during the review of contract documents. By beginning work during this period, he/she will become thoroughly familiar with the project before construction begins. The construction supervisor can advise the project coordinator on technical issues which arise during this period, assisting him/her in carrying out the many tasks involved in bidding and contract award.

Utility Company Notification

Public utility companies should be notified if the project work may affect or involve their property. Information concerning the project's scope and location of work is useful to utility companies in planning their crews' related work. If that work would disrupt planned project improvements, the company may be able to reschedule to eliminate the conflict. The construction supervisor should contact the local public works or street department to obtain information about their customary procedures for utility company notification.

"Dig-Safe" notification is not to be confused with the process described above. Dig-Safe is a utility company notification clearinghouse which, according to state law, contractors must notify seventy-two hours prior to doing underground work. The clearinghouse contacts all utilities with facilities in the work area and provides locational information to the contractor. Its purpose is to promote employee safety on the job and protect the public from accidents and unnecessary utility outages.

Advertising for Bids through the Sealed Bid Method

Advertising is required by law[2] and plays an important part in obtaining the best price for the work to be done. To solicit bids by this process an advertisement (legal notice) must be placed in a newspaper published or generally circulated in the community. Smaller communities should advertise in a newspaper with regional circulation to attract more bidders.

The communities should also send plans and specifications to State Office of Minority Business Assistance (SOMBA) and Dodge Reports. Their addresses are:

State Office of Minority Business Assistance
13th Floor Saltonstall Bldg.
100 Cambridge St.
Boston, MA 02202

Dodge Reports
858 Park Sq. Bldg.
31 St. James Ave.
Boston, MA 02115

In addition, qualified contractors can be informally notified of the ad which announces this project. Other solicitation procedures required by the community's equal employment opportunity or affirmative action commitments must also be followed.

The newspaper advertisement must be published at least two weeks, before the bid opening takes place. This will allow contractors to review the bid package carefully and prepare accurate bids. It also allows enough time for questions to be raised by bidders and answered by the designer, for a prebid conference to occur, and for addenda to be issued, if necessary.

The advertisement must tell when and where bids will be opened and state that any and all bids may be rejected if it is in the public interest to do so. Reference should be made to certain regulations which will be enforced such as affirmative action/equal employment opportunity, prevailing wage rates, and women/minority business utilization plans. The advertisement should also tell: when and where the contract documents can be obtained; if there is a fee for them; the amount of the bid deposit; when and where the prebid conference and site inspection will take place; how bids are to be packaged; and any other information pertinent to bidding procedures which would affect contractors' interest in bidding the job. (See Appendices.)

Distributing Contract Documents

There must be enough copies of documents so that each prospective bidder may obtain a set.[3] In addition, courtesy copies should be sent to Dodge, SOMBA, and other agencies involved in the project. Twenty-five to thirty sets are usually needed. It is suggested that sets be numbered sequentially for record-keeping purposes. A list must be kept of the firms or agencies that have received contract documents. Information recorded should include name, address, phone number, whether the firm is a general or a sub-bidder, and the form of the document fee payment (cash, check, etc.). (Sample form in Appendices.) This list must be prominently posted in the office where the documents are distributed. The person who distributes the documents should have at least a basic knowledge of the work involved in the project. Typically, the construction supervisor is the best person for this task.

Prebid Conference

This conference should be scheduled for seven days before the bid opening is to take place. Written requests for interpretation must be received by the community no later than eight days before the bid opening. This allows interpretation requests to be addressed at the conference. Addenda, if any, must be issued no later than four days before the bid opening. These may include the minutes of the prebid conference including interpretations requested to date.

In preparation for the conference, the project coordinator will determine the time and place and, if necessary, reserve the use of a space in which to hold it. He or she will inform other participants of their role in the conference. Attendees include:

Mandatory	Suggested
Project Coordinator	Prospective Bidders
Construction Supervisor	DPW Representative
Designer	Utility Company Representatives
EEO officer (if any)	Other Municipal Agents
Wage Rate Monitor (if any)	Adjacent Private Developers
	DEM's Construction Advisor

The construction supervisor should call all prospective bidders, encouraging them to attend and should help the project coordinator prepare an agenda for the conference by explaining relevant technical issues. Items for discussion should be solicited from all conference attendees.

The project coordinator will conduct the conference, introducing all participants and providing a frame-work for the information presented by them. The designer will clarify technical issues as requested. The construction supervisor will circulate an attendance sheet, take notes, and encourage attendees to bid the job. After the meeting the project coordinator, construction supervisor, and designer will jointly prepare notes on the meeting to be included in an addendum.

Addenda to the Construction Documents

Substantive changes to the contract documents made during the bid period require written documentation in the form of an addendum. These result from contractors' requests for interpretation and/or the community's desire to introduce minor modifications to the contract documents. Addenda are prepared by the designer and sent out by the project coordinator to all firms which received construction documents or parties who attended the prebid conference. They must also be sent to other agencies who reviewed the construction documents. Addenda must be sent out to prospective bidders by certified mail, return receipt requested, and can be issued no later than four working days before the bid opening.

Bid Opening

In many communities the purchasing agent is responsible for conducting the bid opening. Where there is no such designated agent, the project coordinator will carry out this process.

To encourage bidder participation, the project coordinator should schedule the opening late enough in the day to allow bidders to fit it in to their normal work day. Prior to the bid opening, the project coordinator will set up forms for logging in bid packages in the order received and recording bid amounts at the bid opening. (Sample forms are provided in the Appendices.)

At the precise time set for the opening, the project coordinator must open the bids in the order received and read them aloud,[4] first giving the name of the firm submitting the bid, then stating the amounts of the base bid and each alternate (if any). The construction supervisor makes a quick check to see that each bid is complete and in order. This check includes seeing that all required forms are filled out and submitted,[5] the bid bond is in the required form and amount,[6] and addenda (if any) are acknowledged.[7] After all bids have been read, it is appropriate to announce which firm is the apparent low bidder at the base bid, read out the price detail of the apparent low bidder, and thank the bidders for their participation.

After the bid opening, the construction supervisor will call Dodge Reports and then send them the bid results. The project coordinator will hold the three lowest bidders' bid bonds until a contract is awarded or for thirty days from the date of bid opening.[8] Bonds of all other bidders are returned to them within five days after the opening.

Review of Bids and Bidder's Qualifications

Before the community awards the construction contract, it must verify that the apparent low bidder identified at the bid opening is in fact the lowest responsible and eligible bidder. To make this determination the project coordinator will organize a review of bids by the construction supervisor, designer, and public agencies which have jurisdiction over the project area. The project coordinator should contact each party to find out what information is needed for their review. DEM will want to receive a copy of each bidder's complete package for record purposes, and, at its discretion, may be involved in bid review.

The bid is reviewed for:

1) completeness of information submitted;

2) mathematical accuracy;

3) impact of alternates selected on bidder selection;

4) reasonableness of allocation of costs; and

5) documentation of ability to do the work.

Completeness. The project coordinator will check the three lowest bids to ensure that:

1) all required forms are completely filled out and submitted with the bid;

2) bonds are in required form and are issued by a company authorized to do business in Massachusetts (so stated on the bond);

3) the appropriate officer of the construction company has signed where indicated and signatures are notarized (if the bid form calls for notarization); and

4) if the bid form requires that a corporate bidder affix its seal to the form, that the seal has been used.

Mathematical Accuracy. In the case of a unit price contract, the total contract price results from extension of unit prices. Prices are extended by multiplying the quantities of materials by respective unit prices and summing up the resultant subtotals.

Mathematical errors made in extending unit prices will change the bid amount so that the apparent low bidder may not be the actual low bidder. To determine if a mathematical error has been made, the construction supervisor will recalculate each of the three lowest bidder's bid amounts. To begin, he/she will compare the numerical amount with the written amount for both unit price and total price on each bid item. If the amounts do not agree, the written amount is considered correct. Next, the unit prices are extended. The item totals are added together to find the total price bid.

Any differences between the bid submitted and the corrected bid amount are recorded and the affected bidder(s) notified. If the difference is significant, the affected bidder(s) may be permitted to withdraw the bid. This is allowable if the error is a clerical error,[9] but not if the error is the result of the bidder misinterpreting the contract documents.

Selection of Alternates. The final procedure involved in determining which firm is the actual low bidder is to choose which alternates will be awarded. The alternates must be selected in the order listed in the specifications (#1 only, #'s 1 & 2, #'s 1 & 2 & 3, etc.).[10] The community must first decide how many of the bid alternates it wants and can afford within the project budget. Then the amounts of those alternates are added/subtracted to/from the base bid to find the total contract price. Because the choice of alternates taken may change the designation of the low bidder, this procedure must be applied to all three lowest bids. For example:

	Bidder "A"	Bidder "B"	Bidder "C"
Base Bid	$79,360*	$80,970	$82,110
Alternate #1	+ 6500 $85,860	+ 4500 $85,470*	+ 4000 $86,110
Alternate #2	+ 2600 $88,460	+ 3000 $88,470	+ 2200 $88,310*

* Low bidder

Bidder "A" is the lowest on the base bid amount. However, if Alternate #1 is taken, Bidder "B" is lowest and if both Alternates #1 and #2 are taken, Bidder "C" is lowest. It is illegal to award the contract without the desired alternates and later add the work by change order or to take alternates out of order to influence which contractor gets the job.

Allocation of Costs. When costs are not allocated to the various bid items in a reasonable way, an unbalanced bid results. An unbalanced bid is one in which the prices of some work items are not in keeping with the costs of carrying out that work. One type of unbalanced bid results from the contractor's efforts to compensate for the anticipated lag time between costs incurred in doing the work and payment for work done. Particularly on large public jobs, contractors tend to submit inflated prices for activities that occur early in the project and deflated prices for work done later on. This type of unbalanced bid is not in the community's best interest. When a larger portion of the contract amount will be paid out than the job progress justifies, the community may be left without financial incentives adequate to get the job completed as bid.

Another type of unbalanced bid is one in which a contractor shows low prices on high quantity items and high prices for low quantity items. This is likely to be an indication that the contractor thinks the estimated quantity of high priced items is unrealistically low and intends to make a profit on the job from change orders calling for increased quantities of these items.

The construction supervisor should examine bid item amounts to ensure that a bid is not significantly unbalanced. If the bid is significantly unbalanced, it may be a justification for rejecting all bids and rebidding the job. In making this decision, the community should weigh the impact of the unbalance on budget control versus the impact of rebidding on the desired project schedule and budget.

Ability To Do The Work. Massachusetts law defines a responsible bidder as one who possess "the skill, ability and integrity necessary for the faithful performance of the work."[11] To demonstrate ability, each competing firm submits a statement of bidder's qualifications with its bid including the firm's financial resources, experience, numbers and types of equipment available, other jobs under contract, size of jobs and completion dates. The community may request additional information. (See Appendices for a sample form.)

Because the low bidder has already been established and the contract will be awarded to that bidder if found to be qualified, the construction supervisor need review only that bidder's qualifications.

This assessment must include:

1) contacting the Massachusetts Division of Capital Planning and Operations (One Ashburton Place, Boston, MA 02108) to ensure that the firm is not barred from participating in publicly funded contracts;

2) checking references by contacting other clients and designers the bidder has worked with regarding performance on their projects (ability to schedule work and perform according to schedule, cooperativeness, reporting ability, and quality of workmanship);

3) determining whether the bidder has sufficient related work experience;

4) verifying that the bidder has sufficient manpower and equipment to take on this contract (including consideration of other contracts underway); and

5) verifying financial resources by confirming the bidder's line of credit and responsible fiscal conduct with his/her bank.

Subcontractor's qualifications should be reviewed in less detail, because the contract dictates that the general contractor is fully responsible for all subcontracts.[12] It is suggested that, at a minimum, the major subcontractors' quality of work be reviewed through former clients and/or visiting completed projects.

Rejection of Bids

The community has the right to reject any and all bids if it is in the public interest to do so. The community may choose to exercise this option if bids are unbalanced, not within budget, conditional or incomplete, or if the low bidder does not show evidence of being qualified or fails to execute the contract within the required time period.[13]

Bids Over Budget. A contract cannot be awarded if funds for the full amount of the contract are not available.[14] If all bids are over budget, the community has three options. First, it can allot additional funds to the project. Second, it can reduce the scope of work and rebid the amended contract. Third, it can enter into competetive negotiation with the three lowest bidders. To obtain a bid within budget by competetive negotiation, the community requests the three low bidders to submit bids for a reduced scope of work. The contract is then awarded to the low bidder in the second round of competition.

Unqualified Bidder. Although lowest bid price is the first criterion in selecting a contractor, the low bidder must also be qualified to do the work. When review of the bidder's qualifications shows the low bidder is clearly unqualified, the community may reject the low bidder and accept the next lowest and qualified bidder's price. The rejected bidder has the right to appeal this decision to the Massachusetts Department of Labor and Industry. Therefore, the community must be prepared to document and substantiate its decision should an appeal be filed. In the event of appeal by the contractor, contract progress must be halted until this process has been resolved.

Incomplete or Conditional Bids. Any incomplete or conditional bid must be rejected.

A bid is incomplete if:

1) portions are missing or not filled out;

2) it is not in required form; or

3) the bid bond is missing or issued by an unacceptable company.

A conditional bid is one in which the bidder has amended or modified the bid form without the designer's authorization or has otherwise failed to conform to contract requirements.

Unacceptable Grounds for Rejection. The following are not grounds for rejection of a bid:[15]

1) the sum of the prices submitted by the general contractor and its subcontractors does not equal the general bid price;

2) an error is made in stating the name, price, or total prices of the various subcontractors so long as the subcontractors are clearly identifiable; or

3) the contract documents do not accompany the bids;

Bid Rejection Procedure. Rejection of bids must be made in writing. Notices should be sent along with the bid bonds by certified mail to each bidder. The project coordinator should also notify the Central Register, DEM, SOMBA, and Dodge Reports. The notice should state the decision made, basis for the decision, and course of action the community intends to take.

Contract Award

The community has thirty days from the bid opening in which to determine which contractor is the lowest responsible bidder and award a contract. The chief executive official or his/her designee will make the contract award and have the contract administratively processed. Unsuccessful bidders should be informed of which contractor was selected, the contract price, and the basis of the award. It is traditional to thank them for their participation and encourage them to bid future projects. The award letter sent to the successful bidder should state the contract amount, the five working day time limit for executing a contract,[16] and list the following submittals required before the contract can be executed:

1) annual audited financial statement (applies only to contracts over $100,000);[17]

2) statement of management on internal accounting controls (applies only to contracts over $100,000);[18] and

3) performance and payment bonds in the amount of 100% of the contract price.[19]

If the bidder fails to execute a contract and obtain bonds, the community may award the contract to the next lowest qualified bidder. In this case, the defaulted low bidder's bid bond becomes the community's property to defray the increased costs associated with awarding the contract to the higher bidder.

Preconstruction Conference. This meeting may be combined with the contract execution or take place at a later date. If construction will not begin soon after the contract is awarded (due to seasonal or supplier-imposed limitations), the conference should be scheduled closer to project start-up. This way the most current project conditions will be addressed.

The project coordinator will schedule the preconstruction conference and notify participants. The community must be represented by the project coordinator, the construction supervisor, and the designer. Affirmative action and equal employment opportunity monitors, if any, must attend also. Representatives of other municipal construction agencies and interested officials should be invited to attend. The project coordinator should request that the contractor be represented by the project manager and superintendent who will be working on the project. DEM's construction advisor must be notified of the meeting and may attend at DEM's discretion.

The project coordinator will begin the conference by introducing the participants. Each will be responsible for discussing his/her area of expertise and providing a summary of the information presented for

inclusion in meeting notes. For example, the designer speaks to design and related technical issues, the project coordinator addresses reporting and payment procedures, the construction supervisor is concerned with on site conduct of the job, the affirmative action and equal employment opportunity monitors address required activities and reports.

The project coordinator's presentation must outline the following list of contractor submittals which are required before construction can begin:

1) Certificate of Insurance for Workmen's Compensation;

2) Contractor's Public Liability and Property Damage Liability Insurance (3 originals) and Contractor's Protective Liability and Property Damage Liability Insurance (3 originals);

3) Fire and Extended Coverage Insurance;

4) Vehicle Liability Insurance;

5) documentation of permits obtained, utility company notifications sent, and clearances received; and

6) projected schedule of work and anticipated requests for payment.

The project coordinator will prepare summary notes of the meeting and distribute them to all participants and to DEM.

Notice To Proceed. After the contract has passed through the community's processing system and all required submittals have been received and approved, the project coordinator issues a "Notice to Proceed". This notice includes the names of the contracting authority, project, contractor, the date on or before which construction must begin, time of completion, and amount of liquidated damages. (See Appendices for a sample form.)

In contrast with the preconstruction phase in which activities occur in a prescribed sequence, repetitive and ongoing processes characterize the construction phase. In this phase activity relates to monitoring quality, prosecuting the work, and ensuring that the contractor's responsibilities to the public are met.

Quality Control

Quality control during construction ensures that the community's investment in planning and design comes to fruition. Inspection is the key to quality control, but record keeping and communication are equally important to project success. The use of daily reports, job meetings, and change orders provides an organizational sturcture for carrying out the project.

Inspection. The purpose of inspection--ensuring that project implementation meets specified standards--is simple. However, the process of inspection may be complex and confusing. Many different individuals and agencies participate. Some may be concerned with a single aspect of the project. For example, the municipal electrician is interested only in the lighting system. Other participants, such as the local public works director and DEM, are concerned with the project as a whole. Participants' objectives may differ, sometimes with conflicting results. The project coordinator and construction supervisor are challenged with coordinating the findings and advise of various inspectors to the benefit of the project as a whole. Timing, personal style, and procedures are the factors which make inspection a productive process.

After the Notice to Proceed is issued the community should request the contractor to make an initial site inspection. As part of this, the contractor will check the site survey to verify that property line locations, utilities, trees, and other site improvements are shown correctly on the plans. This inspection may be part of the initial job meeting or, if lengthy, should be scheduled separately. The contractor's superintendent or project manager performs this inspection with the construction supervisor. The designer's attendance is optional.

The contractor inspects the site before beginning work to confirm the existing conditions as shown on the drawings and analyze the condition of existing site elements not scheduled for improvement or demolition. Discrepancies between existing conditions and those bids upon must be carefully documented. Such discrepancies may entitle the contractor to claim extra costs or the owner to receive a credit.[20] Verifying the

survey will also be helpful to accurately measure construction work items not otherwise provided for in the specifications such as earthmoving quantities.

An initial inspection protects community property during construction. The contractor must repair or replace damaged property discovered by inspection. The contractor, in turn, is protected from the community's claims for replacement or repair of property which was damaged or dilapidated before construction began. Photographs and survey notes from this inspection will be incorporated into the plans as documentation of findings. Everyone who customarily attends job meetings and/or has review authority over the project will receive a copy of this information.

Throughout the job the contractor's superintendent is keenly involved with inspection and plays a pivotal role in project implementation. A good superintendent can identify mistakes before or as they happen and remedy them prior to the construction supervisor's inspection. The superintendent also knows the "job logic" and performance standards that determine how it is carried out. (Job logic is the rationale for organizing the work based on availability of materials, equipment and manpower, type of equipment used, employee preferences, seasonal limitations or a desire to balance project cash flow.) Once field activities start, the superintendent uses this intimate knowledge of job logic and construction trades to direct and motivate each tradeperson.

To maintain job logic and quality control, the same superintendent should be on site every working day, all day throughout the life of the contract. If not, the construction supervisor may tend to assume extra resposibilities and legal liability which are properly those of the contractor. To prevent this, the contract should require consistent superintendence. The community should reinforce this with reminders to the contractor at job meetings especially the pre-construction conference.

The community's equivalent to the contractor's superintendent is the construction supervisor. This person makes many daily visits to the site. The first should be as early as possible to find out what work is planned and determine when activities requiring close observation will occur. Critical activities such as concrete finishing, laying asphalt, and tree planting should be continually observed. The construction supervisor regularly inspects the project throughout each day for quality of workmanship and materials. When no activities requiring constant observation are taking place, the construction supervisor should visit the site periodically. This encourages the contractor to maintain a consistent work effort. In addition, the construction supervisor should accommodate the contractor's request for a site visit at any time.

At the end of the work day a final visit should be made to evaluate progress made toward the day's goals. This evaluation is recorded

along with the day's inspection notes in a daily report. During the last daily visit, the construction supervisor also checks site security measures such as barricades and lights.

In addition to daily activities, project milestones (start and completion of significant activities and fail-safe points) call for regular inspection. Typical milestones include approval of a work sample when bricklaying begins, checking concrete or asphalt finishing, or testing underground utilities before they are buried.

Inspection at project milestones may involve the designer if interpretation of the specifications is required. The construction supervisor should anticipate the need for the designer's involvement and request it in advance. When the construction supervisor and designer conduct site inspections together, the designer should direct all communication to the construction supervisor who, in turn, speaks only with the superintendent. This courtesy reflects existing contractual relationships. The outcome of these inspections should be documented as meeting notes with copies sent to all participants.

Some types of inspection (compaction of fill, conductivity of electrical systems) may require skills and equipment which the construction supervisor does not usually possess. In these cases an independent laboratory will perform testing services. If the inspection is for the purpose of accepting a system for municipal operation, tests must demonstrate that the system is functional. Testing for specification compliance includes procedures such as pressure testing of water lines so that the pipe trench can then be backfilled or compaction testing of fill material prior to placing pavement.

Traditionally, the testing laboratory is hired and paid by the contractor, not the community. However, this situation does not achieve adequate segregation of authority and responsibility. Instead, the community should hire the test lab or provide for its hiring under the designer's scope of services. Another approach is to have the testing lab chosen by the community, identified in the contract documents, and called into service on the job by the construction supervisor. This procedure identifies the community as the client while allowing the service to be paid for as part of the construction contract. It does not achieve the same degree of segregation of responsibility as the first alternative described. However, some prefer this method because it does not entail the community's procuring, awarding, and administering a separate contract for testing services.

Regardless of the method by which testing services are provided, the community wants those services completed within the budget allotted. To accomplish this, the community should require that, as possible, the contractor assemble enough work to be tested to make efficient use of the inspection service. However, in some circumstances testing of only one item is necessary. When unplanned testing is needed solely

for the contractor's convenience it should be done at the contractor's expense. The contract documents should clearly express this and the community should address it at the preconstruction conference.

The superintendent is responsible for anticipating the need for inspection as specified in the construction documents. He/she gives the construction supervisor such notice far enough in advance so that testing can be scheduled and completed without holding up work progress. The construction supervisor will contact the test lab and inform the project coordinator of the schedule for the testing. The project coordinator then conveys this information to the designer and other project participants as appropriate. This allows for their presence during testing, if desired. At a minimum, the construction supervisor and superintendent should observe all testing procedures.

Test results will be sent to the community and the designer. They are then incorporated into the daily reports and project files and form the basis for acceptance or rejection of the work item. The project coordinator will furnish copies of the test results to the construction supervisor, general contractor, and other project participants.

The inspection role played by other agencies and individuals will vary depending on the nature of the project, the community's organizational structure, and the funding source(s) involved. These additional inspectors might include the local fire marshall or the commissioner of public works. The project coordinator and construction supervisor should be familiar with statutory and practical rights and obligations of other local and state inspection personnel in order to organize and channel their input.

Requests for inspections, inspection results, and the directives concerning prosecution and progress of work flow through the construction supervisor and project coordinator to and from the contractor and other project participants. The construction supervisor records oral communications in the daily reports. When formally communicated in writing, this information becomes part of the project coordinator's files. As effective communicators, the project coordinator and construction supervisor will gain the confidence of the various project participants. Decisions will then be made more quickly resulting in a savings of time and money to the project.

Most inspections confirm that project improvements are as planned in the specifications. However, when inspection shows that materials or equipment supplied do not conform to the approved shop drawings, samples, or test results, the construction supervisor should inform the contractor of this fact. To remedy the situation, the construction supervisor may reject the items in question and require that they be removed from the site. Alternatively, he/she may allow the contractor to propose a way to bring the supplies into compliance with specified standards. Because correctly installed improvements last longer, the community should require prompt removal and

reinstallation rather than repair of defective work. The construction supervisor should closely observe the contractor's remedial work to ensure that the community's directives are satisfactorily executed.

In order for the inspection, rejection, and correction of work to be productive they must be carried out in a preventative, not punitive, manner. Timely inspection and careful documentation (a combination of daily reports, photographs, and correspondence) will lead the contractor to view inspection in a positive way. The formality of documentation is determined by the seriousness of the error, the parties involved, the cooperativeness of the contractor, and the possibility of future technical or legal difficulities. A good rule of thumb in judging the need for formal documentation is to put into writing only those requirements which the community intends to enforce in full measure.

When construction is 99% complete or has been judged functional and suitable for public use the project is called substantially complete.[21] At this point the contractor may request that the project be accepted and payment be made. When the community receives this request a thorough inspection must be conducted. Participants should include the project coordinator, construction supervisor, the designer, DEM's construction advisor, and the contractor's superintendent and project manager.

This inspection identifies remaining work and deficiencies in completed work. These items make up the punchlist to which all parties attending the inspection agree. The project coordinator confirms the contents of the meeting in a written punchlist sent to the contractor by certified mail. The contractor responds to this with a letter describing the work he/she agrees to perform and states the time-frame for completion.

The timing of final acceptance depends on the extent of guarantee period work to which the contractor is obligated. Projects in which only plant maintenance is guaranteed may be accepted, excluding plant materials, when inspection indicates that punchlist items have been successfully completed. Final acceptance of the plant materials occurs upon successful completion of the guarantee period. For contracts which include general project maintenance during the guarantee period (start-up and winter shut-down of an irrigation system, plant maintenance, general repair, etc.), final acceptance will be delayed until completion of the guarantee period.

If final acceptance closely follows substantial completion, the same individuals should participate. Alternatively, if final acceptance is delayed until the end of the guarantee period, the project coordinator, construction supervisor, and designer may no longer be connected to the project. In this case the community's operating agency should be involved in both substantial completion and final acceptance inspection.

Daily Reports. Reports are prepared daily by the construction supervisor. They consist of text, sketches, photos, receipts, and shipping slips which provide detailed documentation of procedures, problems, solutions and quantities of work accomplished. (See Appendices for sample report forms.) This information is entered on a bid item sheet following the narrative portion of the reports. When the number of bid items involved in a project is more than will fit on one sheet, a log book should be kept. The book will list bid items in numerical sequence and allow space to record the date, quantity used that day, quantity used to date, and where the work was performed. Using a log book instead of bid item sheets will reduce the bulkiness of the daily reports, making them less unwieldy in the field.

Standard information in each report includes: project name and location; the name of the agency administering the contract; the name of the person preparing the report; the name(s) of the general contractor, any subcontractors and their superintendents; and the day of the week and date. Reports are filled out daily and numbered sequentially regardless of whether or not work takes place. This method of reporting indicates work days elapsed for use in monitoring project progress and documents the reasons for work stoppage.

Daily reports include weather conditions, because they affect both the materials installed and the quality of workmanship. The weather should be recorded daily regardless of work underway so there is a basis for evaluating damage to improvements which becomes evident later in the project. For example, temperatures in the morning, noon, afternoon, and overnight are significant when work such as concrete placement or tree planting is underway. Wind conditions affect drying of concrete, lawns seeding, and similar work. Precipitation affects subgrade conditions, siltation of drainage systems, and fresh concrete.

Daily reports record the number of individuals working in each trade. This shows whether the number of employees on the job and their skills are appropriate to the tasks performed and expected rate of project progress. It is useful in monitoring wage rate and non-discrimination requirements. It also documents whether the same superintendent is on the job throughout the project.

The construction supervisor keeps a detailed list of equipment available and used each day. This documents if equipment was available when needed and can be used to evaluate causes of work delays. Equipment used may also indicate potential problems in work products. For example, pavement may heave if the subgrade is not adequately compacted because the roller used was not heavy enough.

By discussing materials in the daily report, the construction supervisor can document the contractor's compliance with specifications and shop drawings. The report should include a written description of materials delivered, stored, used, or rejected.

It should also include documentation such as tags, test results, shipping slips, labels, and portions of packaging. A running tally of types, quantity, and quality of materials delivered and installed is also kept.

Daily reports note pertinent site conditions such as the state of completion of work underway, condition of completed work and existing improvements to remain, subsurface or other latent conditions revealed, and condition of materials stored. A descriptive narrative accompanied by plans is the most effective method of recording these conditions. Such information is helpful in monitoring proper compliance with regulations concerning public health, safety, and welfare, protection of work, and the need for work changes.

A work procedures section of the daily report documents compliance with contract documents, shop drawings, change orders, and field orders. To document construction procedures, the construction supervisor will describe what was done by whom, how, where, when and if known, why. Accounts should be in narrative form with supplementary photos and sketches.

Finally, daily reports serve to log project participants other than the contractor and construction supervisor who visit the site. Except in the case of emergency or threat to public safety, all communication between site visitors and the contractor should be made through the construction supervisor. He/she will accompany visitors on the site and record in the daily reports the name of the visitor, purpose, and the result of the visit.

Job Meetings. The purpose of job meetings is to facilitate communication and decision-making among the parties involved in the project. At these meetings the project corrdinator presents an update of job progress. Discussion focuses on problems, proposed solutions, shop drawings, test results, and permits. The contractor projects the next period's work. Potential problems are identified and mechanisms for solving them are established.

Participants meet as required. Larger, complex, and fast-paced projects demand weekly meetings. For less demanding projects a bi-weekly or as-needed schedule may suffice. All projects will benefit from meetings held at major milestones in the job such as completion of a phase, winter shut-down and spring start-up, and project completion. The interval should be discussed and agreed upon by all parties involved before construction starts. The project coordinator will be responsible for scheduling and conducting the meeting and will record and send meeting notes to other participants.

The following project participants should attend all job meetings: the project coordinator, construction supervisor, the contractor's project manager and superintendent; and the designer. Representatives of other municipal agencies, DEM's construction advisor, and various

subcontractors may attend as desired or requested. At these meetings the construction supervisor and superintendent provide information on day-to-day work activities. The designer evaluates work quality and participates in problem solving. The project manager's special concern is project progress and payment.

Submittals. Submittals establish that the products a contractor intends to use comply with the specifications or allow comparison of specified products with alternate products proposed by the contractor. The contractor should submit to the construction supervisor such items as catalog cuts, shop drawings, technical data sheets, test results, statements of compliance, and materials samples. The general contractor obtains technical information from suppliers and marks it with his/her firm name, project name, and date prior to submission to the community.

Making submittals at job meetings expedites review and approval. The project coordinator receives submittals on behalf of the community, records them in a submittal log (sample form in Appendices), and distributes them to the designer, the construction supervisor, and other project participants such as municipal department of public works for review. If the item submitted is an alternative to that specified, it must also be reviewed and approved by DEM's construction advisor.

The project coordinator conveys other participants' recommendations to the designer who takes them into account in accepting, rejecting, or modifying the item or requiring its resubmission. The designer may require repeated resubmissions until an acceptable submittal is provided. The designer keeps a copy of each sumbittal in official project files and returns copies to the project corrdinator for distribution to those participants who reviewed the submittal. A copy of each approved submittal is sent to DEM for its records.

Shop drawings and other submittals are used in the field by the construction supervisor to determine if the materials supplied are those called for in the specifications. To do this, model numbers, shipping slips, etc. are compared with the approved shop drawings. The shop drawings are also used to check the method of installation. The contractor's superintendent uses shop drawings to check the quality and quantity of delivered goods. Because shop drawings are needed daily in the field, the construction supervisor should have a full set of drawings on site at all times.

Timely submittals help keep the job on schedule. Although ultimate responsibility for work scheduling rests with the contractor, timely submittals benefit the community by establishing that the contractor has taken necessary lead time into account in scheduling work and making submittals. One critical timing issue for the contractor is

the time lag between ordering and receiving a delivery of equipment or materials. Also, the contractor must consider the time required for the community's review of submittals and the possibility that some items may require resubmittal and a second review.[22]

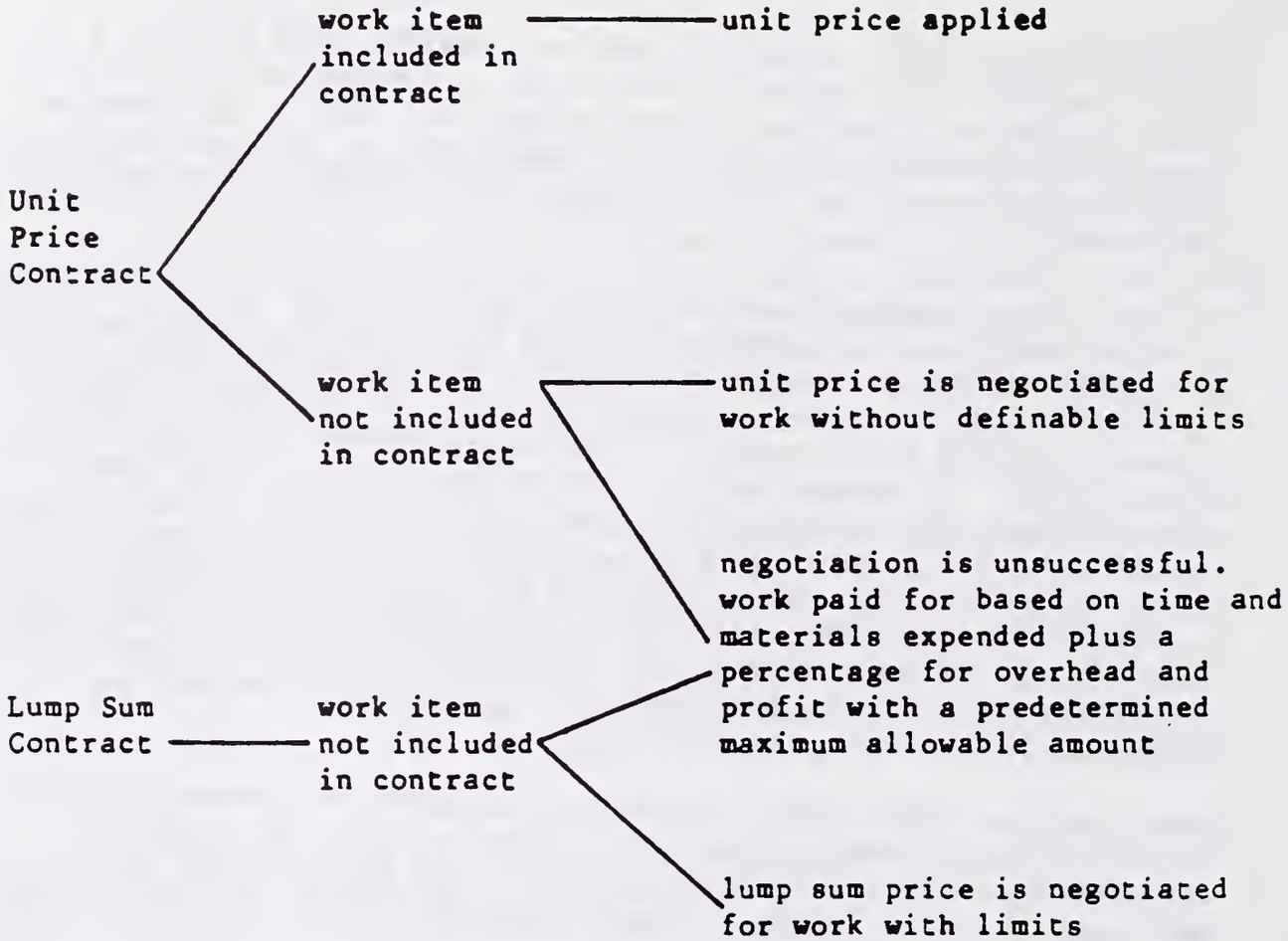
Changes in the Work. No matter how well designed and planned a project may be, unforeseen conditions or situations will arise which require changes. The scope of the project may need to be expanded or reduced, its duration lengthened or shortened, or the work modified. These changes result in additional costs or savings to the parties involved.

Changes in the work are processed as field orders or as change orders. A field order is a decision made by the construction supervisor which has minimal design or budgetary impact. It requires only that the contractor and construction supervisor agree on course of action, record it in the daily reports. They may exchange brief letters of confirmation. (Standard forms which produce a carbon copy are a convenient way of handling this type of communication.) The change should be promptly reported to the project coordinator and may be discussed at the next job meeting. A change order is a change in the work which has significance in terms of design budget, or schedule. Except in an emergency situation, it requires review and approval by all parties with review authority over the project and must be exceuted prior to the work being done.

There are two circumstances in which Massachusetts General Law requires that a change in contract price be made: a change in subbidder used (by the owner's choice)[23] and discovery of unanticipated site conditions.[24] These circumstances are handled as formal change orders.

Any party may request a change through written submittal to the project coordinator. He/she then notifies the designer, DEM, and the construction supervisor of the situation, requesting their advice. The designer responds to the request in consultation with all relevant parties. Technical data generated to address the proposed change order is relayed by the designer to the project coordinator who then requests an adjusted time and price estimate from the contractor. The contractor prepares a cost proposal based on the technical information provided by the designer and the procedure described in the specifications.

The following procedures are used to develop a cost proposal:


Unit Price Contract
work item included in contract
unit price applied
work item not included in contract
unit price is negotiated for work without definable limits
negotiation is unsuccessful. work paid for based on time and materials expended plus a percentage for overhead and profit with a predetermined maximum allowable amount
Lump Sum Contract
work item not included in contract
lump sum price is negotiated for work with limits

The project coordinator will send the contractors' proposal to the designer, construction supervisor, and DEM for review. If all parties agree, the project coordinator will then prepare a change order to be signed by the contractor, the project coordinator, and other appropriate community officials. If the contractor's first proposal is unacceptable, the procedure is repeated until a mutually acceptable proposal is arrived at or it becomes clear that a compromise cannot be reached. Record copies of the approved change order go into the project files and to the construction supervisor, contractor (who informs subcontractors), the designer, and DEM.

The project coordinator and the contractor should each maintain a log of approved change orders for use in preparing and approving requests for payment. The construction supervisor's daily reports should include a record of work done toward completion of each change order in order to monitor job progress.

Disputes. If the community and the contractor fail to reach agreement on an adjusted schedule of payment, Massachusetts Law allows the community to determine an adjustment and order the contractor to proceed with the work. The contractor must promptly comply, but is entitled to appeal the community's change order decision.[25]

Contract specifications typically establish a procedure for monitoring work done under protest. Such procedures provide for notification by the contrtactor to the community prior to doing the disputed work and filing of periodic itemized reports concerning time and materials expended. The construction supervisor should continually monitor contractor's work done under protest to verify that claims for costs incurred are justified. The construction supervisor should photograph work in progress, collect shipping slips, record employee and equipment work hours, and thoroughly describe this work effort. The contractor's reports and claims should be checked and approved the construction supervisor before honoring the claim.

To initiate an appeal,[26] the contractor submits a claim for payment to the chief executive official of the community. This person then has thirty days from receipt of the claim in which to issue a decision. If none is issued, or the contractor disagrees with the decision, the contractor then has twenty-one days to reply. If the amount of the claim is less than $10,000.00 the contractor may file a Notice of Claim for an adjudicatory hearing with the State Division of Hearing Officers (JFK Federal Office Building, Tremont Street, Boston, MA 02201). If the amount is more than $10,000, the contractor must file an action in court. The time for decision by an officer of the court is 120 days from the end of the hearing. The Division of Hearing Officers decision must be returned within sixty days of hearing.

All parties pay for court proceedings and their reputations may suffer as a result of going to court. Therefore, it is best for all parties to resolve their disputes outside of court. Still, the community should not allow the contractor to make unreasonable claims. However, prior to chosing a course of action, the cost of compromising with the contractor should be carefully weighed against that of litigation.

The last resort in resolving disputes is to terminate the contract.[27] Contract specifications typically provide for this measure when the contractor declares bankruptcy, goes into receivership, or makes a general assignment to benefit his/her creditors. Termination is also an option when the contracotr abandons the work, does not meet the specified rate of progress, sublets or assigns work without the community's consent, or violates any other contract provision. When the contract or portion thereof is terminated, the contractor's sureties may be held responsible for completing the job or the community may hire a second contractor to finish all or part of the work remaining to be done. Because of the problems involved in implementing contract termination, the community should first exhaust all other means of recourse.

Prosecution and Progress

Completing construction on time and within budget is as important to project success as is the quality of the facility constructed. Budget control measures must be used to ensure that available funds are sufficient to build the project as planned. During construction the community not only loses use of the facility, but its condition represents a public hazard. Therefore, it is desirable that the work be finished as soon as possible. Monitoring project progress enables the community to foresee problems which could cause delays or cost overruns and resolve them before they become significant.

Monitoring Work Progress. The construction supervisor is the individual within the community's organization who monitors site work. The tools of the job are the contractor's work schedule and the maintenance of daily reports.

Prior to beginning construction the contractor must submit a projected work schedule to the community. The schedule presentation may be as complex as the critical path method or as simple as a bar graph. Whichever type of schedule is used, it should be detailed enough to show that the contractor is taking into account the interrelationship of tasks, deliveries, subcontractors, and seasonal limitations throughout the course of the project. The form of the schedule should allow the construction supervisor to plot actual against projected progress. The contractor must update the schedule periodically throughout the construction process to reflect changes in progress and project their impact both on upcoming work and on project completion.

Daily reports are useful in monitoring progress. They quantify time elapsed during construction and quantities of work completed. The construction supervisor uses these reports to ascertain:

1) the total number of days elapsed;

2) the days worked;

3) the days on which no work was done due to conditions beyond the contractor's control;

4) the days on which no work was done although conditions permitted;

5) the days worked under impractical conditions.

Identifying Problems and Their Solutions. An analysis of the information presented in the daily reports combined with the projected work schedule allows the construction supervisor to foresee when the contractor will need to take additional measures to keep the job on schedule. For instance, it may become evident that equipment and materials will not be delivered when needed or that work having seasonal limitations such as planting and paving will not happen at the appropriate time of year. The apparent solution may be for the contractor to revise the sequence of activities planned, increase the work force, or extend work hours.

Although the community is entitled to enforce time-of-completion requirements, its representatives should avoid giving the contractor specific instructions. According to the terms of the construction contract, keeping the job on schedule is the contractor's responsibility. When the community directs the contractor to take specific remedial measures the community then assumes responsibility for the suggested measure's success. If the instructions fail to produce the desired results, the community is at fault. If the instructions increase the contractor's costs of performing the work, the community must pay for those costs.

When the construction supervisor sees that a scheduling problem exists, the contractor should be notified of it. The contractor then proposes a solution for the community's approval. The construction supervisor uses the work schedule and daily reports to evaluate the contractor's proposal and suggest alternatives. When a stalemate occurs, the community has the option of hiring additional labor and equipment or terminating all or part of the contract and hiring another contractor to complete the work. Since use of this option creates a hostile and disruptive project atmosphere, even its threat should be carefully considered.

Monitoring Expenditure of Funds. Keeping track of cumulative project costs and the rate at which funds are paid out enables the community to evaluate the rate of work progress and the reasonableness of the contractor's requests for payment. It also allows the community to anticipate cost overruns and control the project budget. The ways the community monitors the expenditure of funds depends on the type of contract used. DEM suggests use of unit price contracts because, when based on conservatively prepared estimates of work quantities, they provide a readily useable and accurate means of evaluating work progress.

The daily reports and log book provide a continuously up-to-date document of work completed and are helpful in monitoring expenditure of funds. This record can be applied for use in:

1) budget control;

2) approving contractor's pay requests;

3) settling disputes between subcontractors and the general contractor;

4) reporting to DEM, the contractor's bonding company, and community officials; and

5) timing change-order processing to ensure that enough funds are encumbered to meet anticipated pay requests.

Budget control is achieved by evaluating work progress on an item-by-item basis. From this, potential cost overruns can be projected and possible savings identified. For example, if no ledge rock is encountered in excavation, but additional fill materials are required, the cost savings on rock can be applied to the fill item.

The contractor and construction supervisor should meet prior to the submission of each pay request to review the work quantities completed during that pay period and prepare a pencilled draft of the request. An up-to-date set of daily reports or log book helps tremendously in this review. It lends credibility to the community's claims and reinforces the mutual respect necessary for the parties to work well together. The construction supervisor keeps a copy of the penciled draft for comparison with the contractor's typed request when submitted.

The daily reports and log book should be made available for reference by the general contractor and subcontractors to settle informal disputes regarding quantities of work done. When the dispute is of a more serious nature, the reports may also be used as evidence in court or at official hearings.

The daily reports and log book are also used in preparing and approving change orders. They provide the kind of detailed information necessary to account for the changes which justified execution of change orders. All changes in the work to be performed must be authorized in writing by the community prior to the work being done. A formal change order must be processed to authorize all changes in lump sum contracts. Unit price contracts allow the community to give written authorization of changes in quantities of work under existing work items without requiring a change order. However, a change order is needed when the amount of work to be done affects the quantities provided for in the contract. The daily reports and log book are used to project the need for these adjustments. The community can then process change orders in time to pay the contractor promptly.

Periodically, the community will need to report to others on project progress. For example, the administering department may make quarterly reports to the city manager or board of selectmen. Constituent groups may request updates and the contractor's bonding

company typically demands periodic information on the dollar amount of work completed. Finally, DEM requires regular progress reports and may request additional interim information. By keeping daily records, reporting becomes a routine function, not burdensome in time or effort.

Payment to Contractors. Massachusetts law dicates that contractors bill monthly on public jobs unless the community and contractor agree otherwise.[28] Often contractors prefer to bill less often particularly if a phase or the project as a whole lends itself to a six or eight week billing period. Anticipated billing dates and projected amounts are shown on the contractor's work schedule.

The contractor's bills will include payment for completed work and for materials delivered and stored. Payment for completed work may be broken down according to percentages completed or units installed or may be expressed as time and materials costs. Because it most truly represents actual work progress, DEM prefers that payment be based on units installed. A bill for materials stored must include a bill of sale transferring ownership of materials to the community and an insurance policy on the materials naming the community as the insured party. The construction supervisor should inspect materials where they are stored before the community pays the contractor for them.

Various formats are used in billing. The Massachusetts Department of Public Works form is a good model for use on unit price contracts. The American Institute of Architects offers a form (see both sample forms in Appendices) basing payment on the percent of work completed. This form is best suited to lump sum contracts. The community should decide which model best suits their needs and modify it as necessary. The community should provide the contractor with a reproducible billing form showing standard information such as unit prices. Use of the prepared form will make it easier for the contractor to complete and the commmunity to review the bills. Because the contractor's bill must be approved and paid within the fifteen day limit imposed by Massachusetts Law,[29] the community should require the contractor to submit any outstanding contract compliance reports and agree to quantities of work to be paid for before accepting a bill from the contractor. Contract compliance reports may include statements concerning wages paid or minorities employed. From the completed work quantities agreed upon by the construction supervisor and the contractor's superintendant, the community will deduct the amount of any unpaid claims against the contractor by subcontractors or the community itself, plus a retainage of five percent of the bill amount to guarantee the contractor's performance to project completion.[30]

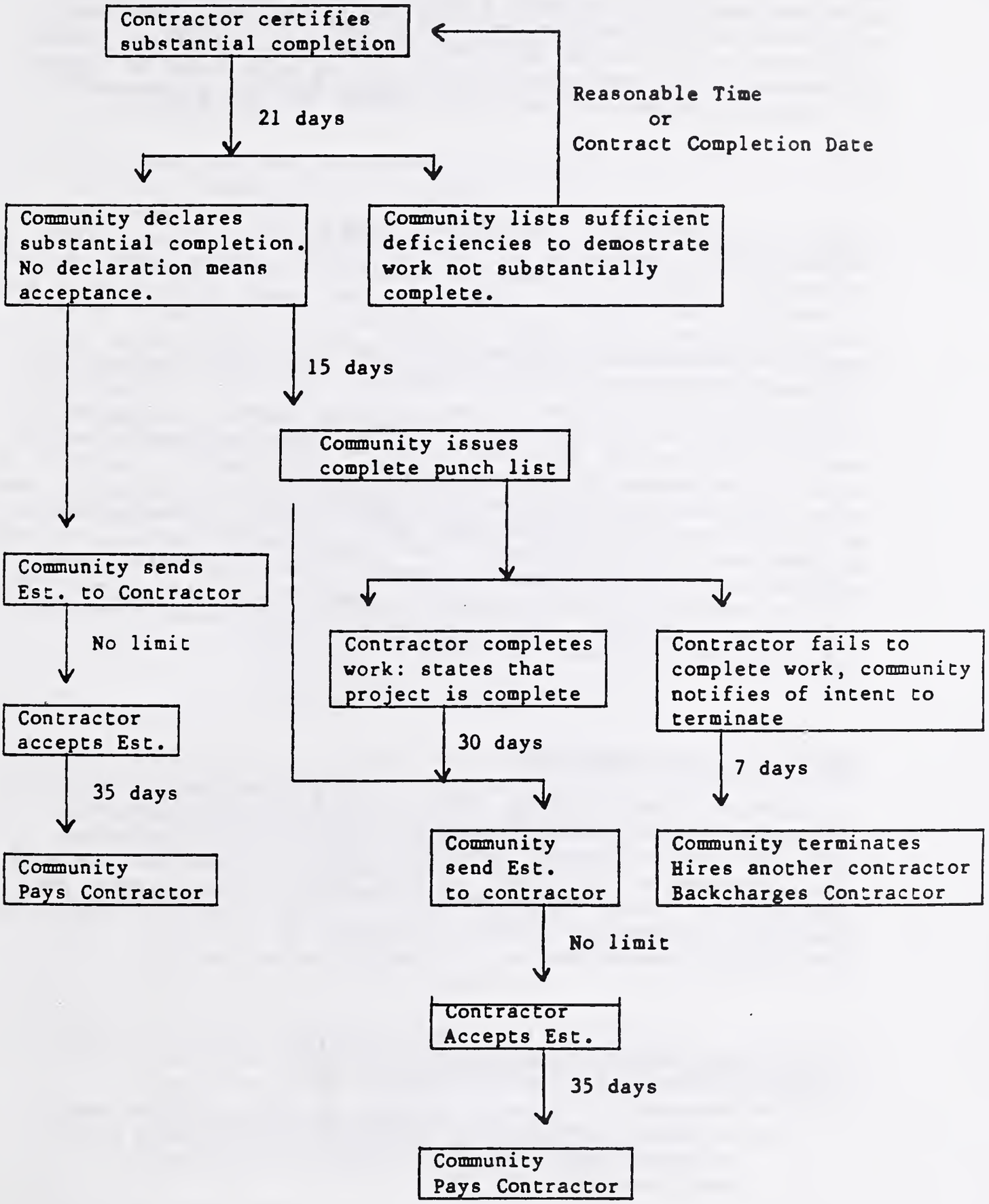
To ensure timely payment of the contractor's bill, the project coordinator should set up a tracking system to monitor the bill's progress through review and payment. The dates and actions taken at each step in the process should be recorded. The project coordinator

should promptly notify the contractor should any delays occur. The bill should be date-stamped as soon as it arrives and the date entered on a payment tracking form. The bill can then be distributed for review and approval. The construction supervisor checks the bills against the pencilled estimate and daily reports. The project coordinator compares it with previous estimates and checks the contractor's calculations. He/she also checks for compliance with equal employment opportunity, wage rates, and other standards or arranges for the appropriate monitoring agencies to verify such compliance. The designer reviews the bill for compliance with the contract documents. DEM reviews it for reasonableness of payment in comparison with work progress. When all parties have reviewed the bill and find it acceptable, it is passed to the local official authorized to approve payments for processing through the community's fiscal system.

As soon as the community pays the general contractor, he/she must pay the subcontractors who have worked on the project during that billing period. This procedure is tightly scheduled to prevent hardship to the contractor and subcontractor(s). The contractor must pay the subcontractor within sixty-five days of completion of the subcontract work. Massachusetts law instructs owners (the community) to take "reasonable steps" to compel the contractor to pay subcontractors.[31] After seventy days, an unpaid subcontractor may demand payment from the community. The subcontractor sends the community a sworn statement hand-delivered or by certified mail, with a copy sent by certified mail to the contractor. This demand for payment should include a detailed account of the balance due and a statement that the work has been completed. The contractor has ten days from the mailing date of the subcontractor's statement on which to issue a responding statement. This must be delivered or mailed in the same way with a copy sent to the subcontractor. The general contractor's reply shall be detailed similarly to the subcontractors in listing the accounts of money owed to the subcontractor by the contractor or vice versa. The community must pay the subcontractor within fifteen days of receiving the demand (less the amount disputed by the contractor, specified by the court, or a standard retainer). As soon as each dispute is settled or each reason for retainage resolved, the owner must bring the payments up to date. Meanwhile, the amounts withheld should reside in an interest-drawing account in the names of the contractor and subcontractor.

A community should anticipate making final payment when its project is substantially complete (the remaining work to be done amounts to only one percent of the total contract price or the site is functionally complete and can be opened for use).[32] All deficiencies in the work must be corrected and all documentation required by the contract completed before final completion is declared. The process by which the contractor claims and the community confirms that the project has reached completion is governed in detail by Massachusetts General Law.

The following diagram depicts the process in a simplified manner:


Contractor certifies substantial completion
21 days
Reasonable Time or Contract Completion Date
Community declares substantial completion. No declaration means acceptance.
Community lists sufficient deficiencies to demostrate work not substantially complete.
15 days
Community issues complete punch list
Community sends Est. to Contractor
No limit
Contractor accepts Est.
35 days
Community Pays Contractor
Contractor completes work: states that project is complete
30 days
Contractor fails to complete work, community notifies of intent to terminate
7 days
Community send Est. to contractor
Community terminates Hires another contractor Backcharges Contractor
No limit
Contractor Accepts Est.
35 days
Community Pays Contractor

In keeping with legal formality, all notifications of completion between the community and the contractor must be made in writing and be sent by certified mail with a return receipt provided. DEM's representative will receive copies of all correspondence concerning completion as will the designer and the community's representatives. Massachusetts Law penalizes the community for delinquence by forcing the community to pay interest on the amount owed the contractor.[33]

Claims for Extra Costs. Massachusetts Law provides for additional payments to the contractor when site conditions encountered during construction differ from those represented in the contract documents[34] or when the community delays the contractor's work progress.[35] It also sets forth change order appeal procedures.[36] The contract specifications usually includes procedures for making claims, paying for costs of delays, and making changes in the contract amount.

Although those provisions in the law and the contract may appear cumbersome to use, in fact they are useful tools designed to protect both the contractor and the community from unreasonable demands by the other party. In applying them, the community should take careful note of the required timing of requests, notifications, and responses and how they are to be communicated. All must be made in writing and some must be in the form of a sworn statement. Each communication must include certain specific information. Some must be sent by certified mail or hand delivered. Certified mail is the preferred method in all cases because it documents receipt.

Responsibility to the Public

In addition to technical and administrative provisions, construction contracts (in accordance with the law) address social concerns, protecting the interest of the general public. These provisions place performance obligations on the contractor which the community must enforce. These obligations can be broadly grouped under the headings of general performance, environmental protection, wage rates, and non-discrimmination.

General Performance Obligations. The general conditions typically specified in the construction contract are:

1) obtaining, paying for, and abiding by all permits and codes, and providing the community with evidence of such compliance upon request;

2) notifying abutters, other community agencies, and utility companies of when, where, and what work will take place;

3) maintaining access and providing adequate security measures (guards, lights, railings, etc.) to public and private ways and buildings at all times of day;

4) protecting, maintaining, and repairing any utility encountered on the work site (at no additional cost to the community);

5) keeping the site secure, clean, and protecting work underway and completed;

6) protecting and restoring existing public and private property from construction activities;

7) providing and maintaining sanitary drinking water and toilet facilities for employee use.

Environmental Protection. These requirements are broadly referred to in the general conditions section of a construction contract. The following list summarizes environmental protection requirements which commonly apply to projects funded by DEM:

(1) plant pest control is regulated as it applies to transporting earthmoving equipment from regulated to uninfested areas. For information on applying this regulation contact:

Massachusetts Department of Agriculture
Plant Pest Control Division
424 Trapelo Road
Waltham, MA
phone: (617) 861-6700;

(2) water pollution control as it applies to siltation-causing operations (earthwork, equipment moving, dewatering, etc.). Typical requirements include the use of silt retention filters along water ways and restricting the methods of discharging polluted waters or intake of water from natural sources for use in contract work;

(3) flood disaster protection requires that flood insurance be obtained and maintained if a project site is located in a special flood hazard area;

(4) historic preservation concerns are addressed by identifying properties listed or eligible for inclusion in the Massachusetts and National Registers of Historic Places that may be subject to adverse effect by the proposed activity, and working with DEM and the Massachusetts Historical Commission to avoid or mitigate that effect;

(5) additional environmental requirements which may be applicable include Federal Executive Order #11988, 16 U.S.C 1456 (c) and (d), the Safe Drinking Water Act of 1974 (as amended), the Endangered Species Act of 1973 (as amended), the Wild and Scenic Rivers Act of 1968 (as amended), the Clean Air Act (as amended), and any corresponding provisions of federal, state, and local laws and regulations.

Enforcing Compliance. Contract documents may not contain specific standards and procedures for determining if a contractor is in compliance with the regulations. Therefore, the construction supervisor is responsible for becoming familiar with applicable regulations and acceptable performance standards. Enforcement should be carried out in a reasonable manner so that protecting the public interest does not unnecessarily affect progress of the work. To ensure that the contractor will comply with these obligations, the community can threaten to shut down the job or terminate the contract. Various other sanctions provided by law may also be applied by the agencies which enforce those laws. Actual termination of a job for non-compliance should be avoided whenever possible.

Wage Rates. Massachusetts Law establishes a pre-determined hourly wage in each trade on publicly funded construction contracts and provides procedures to ensure compliance.[37] The Commissioner of the Department of Labor and Industries regularly issues wage rate determinations which become part of the construction contract. The contractor must post a legible copy of the current wage rates on the job site. Rates may be posted in the contractor's yard where employees gather before or after work if there is no place on the site where posted rates would be protected from the weather. Employees must not be permitted or required to work more than eight hours a day or more than six days a week. They must be paid weekly with payroll reporting forms submitted by the contractor to the community promptly thereafter. The contractor must keep employment records for three years after the contract has been completed. These records must be accessible by the Commissioner upon request. The records are organized by employee and include the name, address, occupational classification, hours worked, and wages paid.

It is the construction supervisor's responsibility to monitor the contractor's compliance with the law. Monitoring procedures should include:

1) taking a photograph of the wage rates posted;

2) recording in the daily reports the number of employees working in each trade;

3) comparing payroll reports with the daily reports;

4) confirming the comparison by confidentially interviewing employees on the site regarding their trade, hours worked, and rate of pay;

5) notifying the contractor of any significant discrepancy between wages specified and wages paid;

6) requesting copies of canceled paychecks (both sides) for all individuals employed on the job during the period in which a violation is suspected;

7) allowing the contractor to rectify the error when notified of an underpayment of wages;

8) requiring documentation of corrected payment, (see #7 above) followed up with interviewing employees in person or by mail; and

9) requiring a statement of compliance be filed before releasing final payment to the contractor.

To obtain the contractor's cooperation with compliance monitoring, the community has the right to withold payment or threaten to terminate the contract. If the contractor refuses to cooperate with the monitoring procedures described above or fails to rectify the underpayment of wages, the construction supervisor should then refer the matter to the Massachusetts Department of Labor and Industries for enforcement. That Department is empowered to enforce compliance by imposing fines and prohibiting the contractor from participating in future public contracts.

Non-discrimination. The community shall require the contractor and subcontractors to conduct business in a non-discriminatory way as provided for by law. The grant agreement between the community and DEM and the community's agreement with the Massachusetts Commission Against Discrimination establish performance standards and specific procedures to ensure compliance. These may include equal employment opportunity and affirmative action activities or the requirement that a certain percent of the contract amount be set aside for award to a state certified woman- or minority-owned business.

The community should be diligent in monitoring the contractor's compliance with non-discrimination requirements. Payment to the contractor should not be released until compliance has been properly documented. Similarly, DEM will withhold grant funds until the community documents compliance.

POST CONSTRUCTION

The post construction phase begins when 99% of the work is done or when the project is functionally complete and can be opened for public use. Careful management remains crucial as the project progresses through contract close-out, guarantee period work, final acceptance, and full operation of the facility by the community. During this phase the project is transformed from a construction site to a publicly used open space. Although construction work may be ongoing at this point, responsibility for the site is transferred from the contractor to the community as each of the final contract requirements are completed.

Project Close-Out

This phase includes preparation and acceptance of "as-built" drawings, compiling and submitting guarantees and warranties on installed equipment and materials, and training the community's maintenance personnel in operating and maintaining the project. Though the contractor should initiate close-out activities, contractors are often slow to attend to these. To counteract this tendency the community should take a firm stand regarding compliance with close-out requirements and continue to hold back five percent of the contract price until the job is totally complete.

Close-out requirements should be discussed in detail at the pre-construction conference. As the job draws to a close, progress toward completing "as built" drawings, assembling guarantees and warranties, and preparing a training manual should be reviewed at each job meeting.

"As-Built" Drawings. While contract drawings depict the work as proposed, as-built drawings record the construction work as installed. The information recorded in these drawings comes from field notes kept by the superintendent on a set of plan prints. The superintendent should keep separate sets of prints on the site for recording changes and directing the work. When construction is completed the community gives the contractor a set of reproducible contract drawings on paper sepias. The contractor then has a registered land surveyor or civil engineer confirm the chnages and draft them onto this set of drawings. Such changes might include new information on subsurface conditions, invert elevations on drain pipes, or the location of underground utility lines.

The corrected set of documents, called "as-built" drawings, is circulated among the project participants for their review. Review comments are sent to the designer for use in approving the documents. Once approved, record prints are made for the designer, DEM, and the community's project files. The reproducible "as-built" drawings remain in possession of the community for future use in making prints should they be needed. These drawings become part of the central filing system within the community such as those of the municipal department of public works, building inspector, engineer, or surveyor.

Guarantees and Warranties. Guarantees and warranties insure the community against deficiencies which may not be evident until after construction has been completed and the project accepted. The contract documents will require certain warranties for equipment and materials manufactured and supplied. For example, the documents may require that a pump be warrantied to a certain flow capacity and number of hours of trouble-free operation. The documents will also contain guarantees concerning the general contractor's obligation to correct deficiencies in the work performed by his/her own crew and by subcontractors and suppliers. Stipulations requiring removal and replacement of heaved pavement or dead plant materials are examples of guarantees typically found in site work contracts.

In addition to protection derived from the contract documents, consumer protection and professional liability laws protect the community from liability. These sources of protection come into play when personal injury or property damage occurs due to a situation beyond the community's control such as fence rail fasteners supplied by the manufacturer or anchor bolts specified by the designer failing to withstand normal use. In such situations the community should seek the advice of legal counsel to determine a course of action.

Guarantees and warranties are sometimes included with shop drawings submitted for review before work is installed. The community should require the contractor to submit a separate compilation of this information in order to facilitate the community's monitoring of guarantee period activities and long-term maintenance.

To assess completeness of the contractor's submissions, the designer and the construction supervisor should jointly prepare a list of submittals required by the contract documents. This list may be supplied to the contractor for use in assembling required information. If the list is to be used in this way, it should be prepared well in advance of contract completion to give the contractor time to obtain this information from suppliers. When a complete set of guarantees and warranties has been submitted, copies should be made for the project files, the designer, and DEM with the original set kept by the maintaining agency for their use.

Training Maintenance Personnel. The contract should require of the contractor an operations manual and training session to provide the community with information necessary to operate and maintain the site. Assembling and reviewing the manual prepares the contractor and the community for carrying out and monitoring guarantee period activities.

The manual provides the community with a basis for evaluating the adequacy of the contractor's maintenance efforts. The contractor obtains and compiles information from the various manufacturers and suppliers whose products have been used in this project. This manual also includes the contractor's proposed schedule of maintenance based on manufacturers' recommendations and contract requirements. In the final draft form, it is submitted to the project coordinator, designer, DEM, and relevant maintenance agencies for review. When these readers indicate that the information submitted is sufficiently complete, the draft is finalized and a follow-up training session is scheduled.

It is wise to have the manual prepared and personnel trained early during the project close-out phase rather than when the project is finally accepted at the end of the guarantee period, because local maintenance crews must assume responsibility for the site as each of the contractor's obligations are fulfilled.

The project coordinator should schedule the training session for the convenience of those personnel who will be carrying out site maintenance. The session is held on the site so that the contractor can present a hands-on application of the manual's instructions. The contractor also arranges to have the manufacturers' representatives participate in conducting the session. At that time, the representatives (or the contractor) supply the community with keys, locks, wrenches, spare lamps, and similar hardware called for by the contract documents.

The Guarantee Period

Construction documents require the contractor to guarantee and/or maintain project improvements for a specified period, usually one year from the date of substantial completion. However, the applicable period for individual items may differ from the general guarantee period. For example, the guarantee for plant materials may be specified as a number of years or growing seasons and may begin on the date the community accepts that particular item whereas the general guarantee is typically one year from the day of final acceptance. During this guarantee period the contractor performs specific maintenance and general operations tasks such as adjusting gate latches, replacing heaved or settled pavement, and realigning directional lighting. The contractor will perform these tasks according to the schedule approved by the community prior to the beginning of the guarantee period.

Although the role of inspector may pass to someone else after construction is complete, quality control is equally important during the guarantee period. If the construction supervisor is no longer involved with the project, the majority of guarantee period inspection will be performed by the maintaining agency by virtue of their crew's daily site maintenance operations. Still, all communication with the contractor should be routed through the project coordinator. He/she should periodically inspect the site with the designer and maintain detailed project records. These records will be useful in determining the acceptability of the project at the end of the guarantee period.

Enforcement of guarantee period requirements follows procedures set forth in the construction contract. Clear, complete, and timely communication is the best method for resolving any issue. Financial leverage is maintained by the community through retainage of 1% of the contract price (or a lesser amount determined by the community to be adequate) until the project is finally accepted. The community should also retain the contractor's bonds and insurance until final acceptance. As always, litigation should be the last resort after all other means of resolution have been exhausted.

Final Acceptance

At the end of the guarantee period, the contractor (including major suppliers and sub-contractors), the project coordinator, designer, DEM, and maintenance agent tour the site together to inspect its condition. They identify any deficiencies and try to determine their cause. Periodic inspection during the guarantee period and detailed record keeping of it will serve as a justifiable basis for determining reasons for any damage identified at the final inspection and assigning responsibility for its repair.

The tour of final inspection not only prepares the project for acceptance, but is a valuable opportunity for participants to evaluate the project outcome and exchange information useful to ongoing maintenance and planning for future projects. Personal dynamics will dictate how best to structure such an exchange of information. If a spirit of cooperation exists, a group discussion may be an effective forum. If there is tension between participants, an informal one-to-one approach may be more productive.

After inspection the project coordinator prepares a list of tasks the contractor and community have agreed upon as conditions for final acceptance. Once these are performed and the maintenance agent and project coordinator sign in acknowledgement, the list constitutes final acceptance of the project. Retainage, bonds, and insurance are then released to the contractor.

Ongoing Maintenance

The community's planning, design, and project management efforts have culminated in the rehabilitation or creation of a facility needed by the community. The project must be carefully maintained. If neglected, vandalism is more likely to occur causing the condition of the improvements to deteriorate further.

The project coordinator should begin to plan with local officials early in the project (preferably beginning during design) to provide for maintenance. Initially, the community identifies which local agency will assume responsibility for the site when the contractor's obligations are completed. When the contractor submits the operations manual and schedule of guarantee period work, planning becomes more concrete. The community is then in a position to evaulate its staff, equipment, and budgetary capabilities in order to intelligently allocate its resources for the continuing maintenance of the site.

At the end of the guarantee period the project coordinator, maintenance agent, and contractor should discuss the outcome of the maintenance practices. The exchange should focus on:

1) identifying problematic or high maintenance items or areas;

2) describing solutions devised and their success;

3) calculating the employee and equipment hours required to maintain desired site conditions.

The community can apply this information knowledgably in modifying the contractor's guarantee period work schedule to yield one that is practical for the community's long term use. Periodic review and revision of this schedule is advisable as maintenance capabilities change and the site improvements age. The community will find that good records of maintenance and site use help in revising the maintenance schedule, in justifying budget requests necessary to continued effective maintenance, and in planning for successful new site projects.

FOOTNOTES

1 MGL Ch 149 ss 44G
2 MGL Ch 140 ss 4B
3 MGL Ch 149 ss 44B
4 MGL Ch 149 ss 44E
5 MGL Ch 149 ss 44E
6 MGL Ch 149 ss 44B, MGL Ch 30 ss 39M
7 MGL Ch 149 ss 44E, MGL Ch 30 ss 39M
8 MGL Ch 149 ss 44B
9 MGL Ch 149 ss 44B
10 MGL Ch 149 ss 44G
11 MGL Ch 30 ss 39M
12 MGL Ch 149 ss 44F
13 MGL Ch 149 ss 44E, MGL Ch 30 ss 39M
14 MGL Ch 44 ss 31C
15 MGL Ch 149 ss 44E
16 MGL Ch 149 ss 44E
17 MGL Ch 30 ss 39R
18 MGL Ch 30 ss 39R
19 MGL Ch 149 ss 44E
20 MGL Ch 30 ss 39N
21 MGL Ch 30 ss 39G
22 MGL Ch 30 ss 39P
23 MGL Ch 149 ss 44F
24 MGL Ch 30 ss 39N
25 MGL Ch 30 ss 39Q
26 MGL Ch 30 ss 39Q
27 MGL Ch 149 ss 44F
28 MGL Ch 30 ss 39K
29 MGL Ch 30 ss 39K
30 MGL Ch 30 ss 39K
31 MGL Ch 30 ss 39F
32 MGL Ch 30 ss 39G
33 MGL Ch 30 ss 39G
34 MGL Ch 30 ss 39N
35 MGL Ch 30 ss 39Q
36 MGL Ch 30 ss 39Q
37 MGL Ch 149 ss 27

APPENDICES

The following forms are presented for the community's discretionary use. At its option, the community may continue to use comparable forms it typically uses or may modify these forms to suit local needs. The community is advised to have all contract forms reviewed by legal counsel prior to use.

Small Purchase Contract

Invitation for Bids

List of Prospective Bidders

Record of Bids Received

Statement of Bidder's Qualifications

Notice to Proceed

Log of Shop Drawings/Submittals

Daily Reports

Log Book Entries-Sample

Unit Price Pay Requisition

Lump Sum Pay Requisition

TYPICAL FORM OF CONTRACT: SMALL PURCHASE PROCUREMENT METHOD

1. THIS AGREEMENT is made on _____ between
(Date)
_____ of _____
(Contractor) (Address, City, State)

_____, hereinafter called "Contractor"
(Tel. No.)

and _____ of _____
(Owner) (Address)

hereinafter called "Owner", for work to be done at _____

_____.

2. WORK: Contractor agrees to do the following work for Owner (Fully describe work and materials):

_____

_____

_____

_____

_____

_____

_____

_____

_____

3. PRICE: Contractor agrees to do such work for no more than the price of $_____. Contractor understands it is his responsibility on completion of the work and before final payment, to furnish Owner with an itemized statement of work done. The statement shall include: 1) a list of parts and materials, including a statement of whether the parts and materials are new, used or rebuilt; 2) the

cost to the Owner of such parts and materials; and 3) the number of hours of labor charged to the Owner. If the work is done by someone other than the signing Contractor, the statement shall also include: 4) the name of the person or persons who actually did the work.

4. EXPRESS WARRANTY: Contractor guarantees to Owner that all materials incorporated into the work will be new unless otherwise specified or agreed. Contractor also guarantees that all work will be done in a workmanlike manner, free from defects, and in conformance with any specifications mentioned in paragraph #1.

Work under this Agreement is guaranteed for _____ (time period).

If any defect in materials or workmanship arises within this time, Contractor agrees to repair such defects and to bring the work up to the standards required under this Agreement at no additional cost to Owner. This guarantee in no way limits or supersedes any other remedy available to Owner under the law in the event of defective work.

5. PAYMENT: Contractor shall be paid by Owner according to the following schedule: _____.

6. COMMENCEMENT & COMPLETION OF WORK: Contractor will begin the work to be done under this Agreement on (date)_____. Work shall be completed as soon as possible, but in no event later than (date)_____. Time is of the essence in this Agreement.

7. PERMITS: Contractor certifies that he will obtain any necessary permits or other documents which are required for the work being done Such official fees shall be disclosed as an item of cost.

8. LICENSING: Contractor certifies that he has complied with any applicable licensing laws. Contractor is licensed as _____ _____ with license number _____.

9. INSURANCE: Contractor is insured by _____ for injury incurred by Contractor or Employees while they are working under this Agreement. Contractor is insured by _____ for public liability. (Attach copies of insurance certificates)

10. MODIFICATION: This Agreement, including price(#2) and time (#6) provisions, cannot be changed except by a written statement signed by both Contractor and Owner.

11. ADDITIONAL TERMS: (Insert any additional terms agreed to by both parties)

_____

_____

_____

Contractor must deliver to Owner a copy of the signed completed contract within five business days of the date of this Agreement.

CONTRACTOR AND OWNER HEREBY AGREE TO THE ABOVE TERMS.

_____ _____
(Contractor's Signature) (Date)

_____ _____
(Owner's Signature) (Date)

CITY OF

INVITATION FOR BIDS

The City of will receive sealed bids for

, Massachusetts, until A. M. on at the office of the Mass.
, at which time and place all bids will be publicly opened and read aloud.

Bid Documents, including Drawings and Specifications, may be examined at or obtained from by depositing in cash or a Certified Check payable to for each set obtained. Each such deposit will be returned if the Bid Documents are returned to in good condition within working days after the opening of bids. Copies of the Bid Documents shall only be mailed upon written request, which must include a non-refundable handling charge plus a separate check of for each set of Bid Documents requested. Bid documents will be available

A certified check, treasurer's or cashier's check, or bid bond, payable to the in an amount equal to five percent (5%) of the base bid shall be submitted with each bid. A Performance Bond and Payment Bond in the amount of 100% of the Contract Price will be required as part of the Contract.

Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Contract Documents must be paid on this project.

Bidders will be required to comply with the President's Executive Order 11246 as amended by Executive Order 11375, pertaining to equal employment opportunity and affirmative action. The requirements for bidders and contractors under this order are explained in the specifications. The Bidder's attention is called to of the General Specifications.

Site inspection will be held at the site on A.M. for all prospective bidders.

PROSPECTIVE BIDDERS

Project Title:
Bid Opening Date:
Project Administered By:

Document #	Firm Name	Address/Phone #	Trade	Form of Document Fee

RECORD OF BIDS RECEIVED

Project Title:

Bid Opening Date:

Project Administered By:

Name/Address of Bidder	Base Bid	Alternates		Form of Security			Remarks
				Bond	Check	Cash	

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder

2. Permanent main office address, including ZIP code and telephone number.

3. When organized.

4. If a Corporation, where incorporated?

5. How many years have you been engaged in the contracting business under your present firm or trade name?

6. Contracts on hand (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion).

7. General character of work performed by your company.

8. Have you ever failed to complete any work awarded to you?

   If so, where and why?

9. Have you ever defaulted on a contract?

   If so, where and why?

10. List the more important projects recently completed by your company, stating the approximate cost for each, and the month and year completed.

11. List your major equipment <u>available for this contract.</u>

12. Experience in construction work similar in importance to this project.

13. Background and experience of the principal members of your organization, including the officers.

14. Credit available: $_____.

15. Give bank references:_____

16. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the City of ?_____

17. The undersigned hereby authorizes and requests any person, firm or corporation to furnish any information requested by the City of in verification of the

recitals comprising this Statement of Bidder's Qualifications. Dated at

_____ this _____ day of _____,19___.

_____
(Name of Bidder)

_____

_____
(Title)

State of _____

County of _____

_____being duly sworn deposes and says

that he is _____ of_____
(Name of organization)

and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn before me this _____ day of

_____, 19__.

_____
Notary Public

My Commission expires _____, 19_____.

NOTICE TO PROCEED

Project: _____

Contractor: _____

Awarding Authority: _____

DATE: _____

You are hereby authorized to proceed with work on the above referenced project on or before _____. The work shall be completed within the specified Time of Completion (_____ calendar days). After such time liquidated damages will be assessed at the rate of _____ per day.

Issued By: _____

Title: _____
(Awarding Authority)

Acknowledged By: _____

Title: _____
(Contractor)

DAILY PROCESS REPORT

SHEET NO.

BIDS ITEMS

ITEM	DESCRIPTION	QUANTITY UNIT	PREVIOUS	TODAY	TO DATE

Sample Log Book Entries

Item #103	Tree Removal	Est. Quantity: 12 ea	
DATE	Description of Work	Quantity Today	Quantity To Date
3/7/86	14" maple @ S.W. entry to site 10" dead tree by garage	2	2
3/13	3-6" trees along drive 9" oak by fountain	4	6

Item #241	12" Reinforced Concrete Pipe	Estimated Quantity 273 l.f.	
4/15/86	From M.H. in Main St. to M.H. #1 on site	36'	36'
4/16	From M.H. 1 to CB 1 From M.H. 1 to MH 2	17' 75'	 128

LOG OF SHOP DRAWINGS/SUBMITTALS

PROJECT: _____ PROJECT NO. _____

CONTRACTOR: _____ SHEET ____ OF ____

SUB-MISSION #	DATE REC'D	SPEC. NO.	DESCRIPTION	CONTRACTOR SUBCONTRACTOR TRADE	# REC'D	REFERRED TO	REFERRED DATE SENT	REFERRED # COPIES	REFERRED DATE RET'D	ACTION APPROVED	ACTION APPROVED AS NOTED	ACTION REVISE & RESUBMIT	ACTION NOT APP'D	REMARKS	DATE RET'D	COPIES TO CONTRAC.	COPIES TO OWNER	COPIES TO D.E.M.	COPIES TO FILE
1																			
2																			
3																			
1																			
2																			
3																			
1																			
2																			
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DAILY PROGRESS REPORT

(Awarding Authority)

PROJECT TITLE:

REPORT # _____

SHEET 1 _____ _____

DATE: _____ 19____

CONTRACTOR: _____

SUPERINTENDENT _____

WEATHER _____

TEMPERATURE _____
A.M. NOON P.M.

LABOR & EQUIPMENT:

Prepared By: _____

WORK ACCOMPLISHED:

Sheet ___ of ___

Requisition No._____ Requisition Date_____ Period Covered From _____ to _____

Change Order Summary			
Change Orders approved in previous months by the Department — Totals		ADDITIONS	DEDUCTIONS
Approved this Month			
No.	Date Approved & Description		
	Totals		
Net Change by Change Orders			

The Undersigned Contractor certifies that to the best of his knowledge, information, and belief the Work covered by this requisition has been completed in accordance with the Contract Documents, that all amounts have been paid by him for Work for which previous requisitions were issued and payments received from the Department, and that current payment shown herein is now due.

_____ by _____ Date _____
Contractor

(If sub-contractors are employed)

I hereby certify under the penalties of perjury that payments have been made to all sub-contractors in compliance with the provisions of Chapter 609 of the Acts of 1954 as set forth in Article VII of the Contract.

Contractor's Signature _____ Date _____

The present status of the account for this contract is as followers:

Original Contract Sum.....$_____

Net Change by Change Orders.....$_____

Contract Sum to Date.....$_____

Total Original Completed & Stored to Date.....$_____

Total Change Orders Completed & Stored to Date.....$_____

Total Completed & Stored to Date.....$_____

Retainage 5%.....$_____

Total Earned Less Retainage.....$_____

Less Previous Payments.....$_____

Total Due this Payment.....$_____

In accordance with the Contract Documents based on on-site observations and the data comprising the following requisition, the Undersigned certifies to the Department that the work has progressed to the point indicated; that to the best of their knowledge, information and belief the quality of the work is in accordance with the Contract Documents; and that the Contractor is intitled to the current amount due.

_____ Date _____
Department

_____ Date _____
Designer

TYPICAL UNIT PRICE-TYPE PAY REQUISITION FORM

PROJECT NO. REQUISITION NO: SHEET ___ OF ___

	B	C	D	E	F	G	H	I	J	K	L
					PERCENTAGE/ UNITS COMPLETED						
M .	DESCRIPTION OF WORK	ESTIMATED QUANTITY	CONTRACT UNIT PRICE/ LUMP SUM	SCHEDULED VALUE	PREVIOUS REQUISITION	THIS REQUISITION	TOTAL TO DATE	TOTAL WORK COMPLETED (E×H)	STORED MATERIALS (NOT IN I)	TOTAL COMPLETE & STORED TO DATE (I+J)	% OF SCH. VAL. (K÷E)
	TOTAL - ORIGINAL CONTRACT										
	LIST CHANGE ORDERS BELOW										

CHANGE ORDER PAYMENT FORM

Project No._____ Requisition No._____ Sheet____ of_____

A	B	C	D	E	F	G	H	I	J	K	L
Item No.	Description of Work	Estimated Quantity	Contract Unit Price/ Lump Sum	Scheduled Value	Percentage/Units Completed			Total Work Completed (D×H)	Stored Materials (not in I)	Total Complete & Stored to Date (I+J)	% of sch. val (K÷E)
					Previous Requisitions	This Requisition	Total To Date				
List Change Orders Below (Additions Only)											
Total Change Orders (Additions)											
List Change Orders Below (Deductions Only)											
Total Change Orders (Deductions)											
Net Change by Change Orders											

APPLICATION AND CERTIFICATE FOR PAYMENT *AIA DOCUMENT G702* (Instructions on reverse side) PAGE ONE OF PAGES

TO (OWNER):

PROJECT:

APPLICATION NO:

Distribution to:
[ ] OWNER

PERIOD TO:

[ ] ARCHITECT
[ ] CONTRACTOR

FROM (CONTRACTOR):

VIA (ARCHITECT):

ARCHITECT'S PROJECT NO:

[ ]
[ ]

CONTRACT FOR:

CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

CHANGE ORDER SUMMARY		
Change Orders approved in previous months by Owner TOTAL	ADDITIONS	DEDUCTIONS
Approved this Month		
Number / Date Approved		
TOTALS		
Net change by Change Orders		

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

Application is made for Payment, as shown below, in connection with the Contract. **Continuation Sheet, AIA Document G703,** is attached.

1. **ORIGINAL CONTRACT SUM** ..... $ _____
2. **Net change by Change Orders** ..... $ _____
3. **CONTRACT SUM TO DATE** (Line 1 ± 2) ..... $ _____
4. **TOTAL COMPLETED & STORED TO DATE** ..... $ _____
   (Column G on G703)
5. **RETAINAGE:**
   a. ____ % of Completed Work $ _____
   (Column D + E on G703)
   b. ____ % of Stored Material $ _____
   (Column F on G703)
   Total Retainage (Line 5a + 5b or Total in Column I of G703) ..... $ _____
6. **TOTAL EARNED LESS RETAINAGE** ..... $ _____
   (Line 4 less Line 5 Total)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT** (Line 6 from prior Certificate) ..... $ _____
8. **CURRENT PAYMENT DUE** ..... $ _____
9. **BALANCE TO FINISH, PLUS RETAINAGE** ..... $ _____
   (Line 3 less Line 6)

State of: County of:
Subscribed and sworn to before me this day of ,19
Notary Public:
My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the above application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $ _____
(Attach explanation if amount certified differs from the amount applied for.)
ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

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